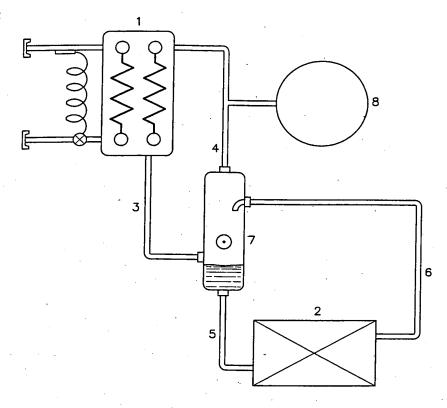


Carbon Dioxide Secondary Coolant System with Fade-Out Vessel

System Schematic:



Charge Analysis:

Properties @ +75°F, 450 Psig:

Vapor Density, ρ_{vapor} : = 5.2 [Lb/Fi³]

Properties @ -20°F

Liquid Density, p_{liquid}: = 66.86 [Lb/Ft³]

Vapor Density, ρ_{vapor} = 2.41 [Lb/Fl³]

Quality at $5.2 \text{ [Lb/Ft}^3\text{]} = 0.43 \text{ (from P-h diagram)}$

•		INTERNAL	. •	LIQUID	
ITEM	COMPONENT	VOLUME		CHARGE	
# `	DESCRIPTION	[Ft ³]		[Lbs.]	
1	Heat Exchanger	0.117		1.96	
2	Evaporator	0.109		3.64	
3	3/8" Type L Copper Tube, 2' Long	0.0011	•	0.07	
4	5/8" Type L Copper Tube, 2' Long	0.0032		0.00	
5	3/8" Type L Copper Tube, 4' Long	0.0022		0.14	
6	5/8" Type L Copper Tube, 4' Long	0.0065		0.00	
7	Hill PHOENIX Liquid-Vapor Separator	0.0218	•	0.15	
		0.261	Total Liquid R-744 Charge =	5.96	

Total System Mass for above liquid mass and system density: 10.46 [Lb]
Required System Volume to hold total charge: 2.01 [Ft³]
Required Volume of Fade-Out Vessel: 1.75 [Ft³]

SIZING PROCESS ON PRESSURE ENTHALPY-DIAGRAM

